A Quasipotential Approach in Benard Problem in Anisotropic Liquids

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The appearance of long-lived and great fluctuations of planar oriented nematic mesophase velocity and its temperature where shown near critical point in the temperature gradient presence. The size and live times of appearing hydrodynamic convection rolls in Benard point are restricted as in the case for isitropic liquids only by nonlinear interaction of critical modes with passive ones. The functional method was proposed in order to solve such a problem: to investigate nonlinear behaviour of anisotropic liquid (nematic liquid crystal) in the temperature gradient. Generalized Thermodynamic Potential for mentioned nematic was constructed with aid of the perturbation method. One-dimensional and two-dimensional fluctuations of a complex amplitude fluctuations were calculated. The all hydrodynamic variables in our problem are expressed by the mentioned slow amplitude near critical point. This approach allowed to get the region where Landau approximation works well. Time correlation functions of hydrodynamic fluctuations in oriented nematic has been derived too.